Texas Water Development Board

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TO: Board Members

THROUGH: Kevin Patteson, Executive Administrator
John Steib, Chief Deputy Executive Administrator
Robert E. Mace, Ph.D., P.G. Deputy Executive Administrator, Water Science and Conservation
David Carter, Manager, Contracting and Purchasing

FROM: Brenner Brown, Management Analyst

DATE: January 7, 2013

SUBJECT: Research and Planning Funds for Rio Grande Salinity Studies

ACTION REQUESTED

Authorize the Executive Administrator to negotiate and execute a research contract in a total amount not to exceed $112,500 from the Research and Planning Fund for fiscal year 2014 for salinity studies in the Rio Grande watershed.

BACKGROUND

The Rio Grande Salinity Management Coalition consists of the Rio Grande Compact Commission, and water managers and water user groups from Colorado, New Mexico, and Texas. Through the Rio Grande Salinity Management Coalition, the states of New Mexico and Texas have been working cooperatively to identify solutions to concerns regarding the quantity and quality of the water delivered to the state of Texas.

Elevated salinity has long been recognized in the Rio Grande Project area, which extends from above Elephant Butte Reservoir, New Mexico, to Fort Quitman, Texas. In 2007 the Rio Grande Compact Commission, comprised of representatives from state and federal agencies from New Mexico, Texas, and Colorado, requested a watershed assessment study to be conducted by the U.S. Army Corps of Engineers. In 2009 the New Mexico Interstate Stream Commission and the U.S. Army Corps of Engineers, working closely with the Rio Grande Salinity Management Coalition, completed the first phase of a Water Resources Development Act Section 729 Rio Grande Salinity Management Program which included a geospatial salinity database, a U.S. Geological Survey Rio Grande Salinity Assessment Study and a Rio Grande Economic Impact Assessment Study.

A Watershed Assessment Cost Sharing Agreement with the state of New Mexico Interstate Stream Commission executed on September 2, 2008, was amended in 2012 to add the Texas Commission on Environmental Quality as an additional local sponsor.

KEY ISSUES

In 2007 the New Mexico Interstate Stream Commission and New Mexico Environmental Department committed $250,000 to be matched 3 to 1 by the U.S. Army Corps of Engineers for a Water Resources Development Act Section 729 study to be conducted on the Rio Grande from San Acacia, New Mexico, to Fort Quitman, Texas. At the Rio Grande Project Salinity Management Coalition meeting on January 11, 2008, the state of Texas, through El Paso Water Utilities and Texas Water Development Board staff, committed to devote funds, pending availability of funds and Board approval, equal to the commitment of New Mexico to this project. In 2012 the Texas Commission on Environmental Quality, the Texas sponsor for this project, committed $100,000 for phase II of the study. In 2012 the Board approved a request from the Texas Commission on Environmental Quality, to provide $37,500 from Research and Planning Funds for salinity studies along this stretch of the Rio Grande.

In order to implement additional tasks as part of an amended cost share agreement, the Texas Commission on Environmental Quality has requested an additional $112,500, to be matched 3 to 1 by the U.S. Army Corps of Engineers, to complete an expanded scope of work for project identification in the Rio Grande Basin. These additional tasks include an economic analysis on the siting, construction, operation, and maintenance of salinity management alternatives (Attachment). This analysis will provide not only the costs of construction of an alternative but also the benefits to agriculture, municipalities, and industries. The analysis will develop cost/benefit ratios for the construction, maintenance, and operation of the alternatives.

Currently the U.S. Army Corps of Engineers has $300,000 of the $337,500 to be used as a match for the funds requested. The U.S. Army Corps of Engineers anticipates the remaining $37,500 to be available in Fiscal Year 2014. Funds for this project will be used as matching funds from the U.S. Army Corps of Engineers are made available. To ensure that costs for this project are shared equally, New Mexico and Texas will be reimbursed proportionally if the U. S. Army Corps of Engineers is unable to provide the 3 to 1 match for the entire $112,500.

RECOMMENDATION

The Executive Administrator recommends approval of this item.

This recommendation has been reviewed by legal counsel and is in compliance with applicable statutes and Board rules.

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Les Trobman
General Counsel

Attachment: Scope of Work

Attachment
Scope of Work developed by U.S. Army Corps of Engineers and Rio Grande Salinity Management Coalition

This attachment is an amended scope of work identifying tasks for the completion of phase II of the ongoing Rio Grande Salinity Management Program under Section 729 of the Water Resources Development Act.

Definition of Terms
A-E - Architectural/Engineering Contractor
M&I – Municipal and Industrial
ISC - Industrial Source Complex model
PEIA - Programmatic Environmental Impact Analysis
PGN – Planning Guidance Notebook

U.S. Army Corps of Engineers
Section 729
Rio Grande Salinity Study
Economic Cost / Benefit Analysis of
Salinity Management Alternatives

The A-E shall conduct an economic analysis on the siting, construction, operation and maintenance of salinity management alternatives through the completion of Tasks 1 – 7, outlined below. This analysis would provide not only the costs of construction of an alternative, but also the benefits to agriculture, municipalities, and industries. The analyses will develop cost/benefits ratios for the construction, maintenance and operation of the alternatives. A Technical Memorandum shall be prepared that summarizes the existing and future without conditions, and presents the results of the cost/benefit economic analyses for each alternative.

Task 1: Characterize the Existing Conditions of the Salinity Management Alternatives Geographic Areas

The purpose of this task is to define how the analysis is organized geographically and to set the baseline agricultural, municipal and industrial conditions—acreage, production, water use, municipality population, infrastructure, industry types, costs, revenues, etc.—against which benefits of salinity reduction alternatives will be measured.

Task 1.1: Define the Geographic Area for each Salinity Management Alternative

Define the geographical bounds and characteristics of the study area and appropriate subareas as recommended above. The study area will be limited to the upper extent of the Montoya Drain on the upstream side of the Rio Grande, downstream to Ft. Quitman (Figure 1).

Task 1.2: Update Data for Existing Conditions

Municipal & Industrial (M&I) Conditions

Compile the most recent data on M&I conditions.

- Use existing mapping to compile information available on municipalities and industries (data on municipality population, industry types; water use, etc.). Research to find available data.
- Document the data gathered and updated, including summary tables that characterize water use by municipality and industry, as well as current costs to treat saline water.

Agricultural Conditions

Compile the most recent data on crop acreage, crop prices, yields, and production costs. The subarea data has already been gathered and incorporated into the methodology of the PEIA and Addendum. That data should be reviewed and, as needed, updated with the following data items:

- Document the data gathered and updated, including summary tables that characterize agricultural production and costs by crop and subarea.

- Use existing mapping, compile agricultural information available (data on crop types, acreage by major crop type, crop yields; water costs, etc.). Research to find available data.

Natural Resources
Identify the presence and location of known resources that are not yet identified.

- Use existing mapping, compile ecological information available (data on vegetation, etc.). Research to find available data.
- Field analysis of project area including mapping of wetland and riparian areas, vegetation mapping (if not available).
- Conduct wildlife surveys as needed – avian species, other.
- Prepare Existing Ecological Conditions Report/Section for Feasibility Report

Task 2: Assess Future Conditions without Project
Quantify and justify any acreage, crop market, water use or production changes that are expected to occur over time, in the absence of a salinity reduction alternative. Justification could include projected conversion of agricultural land to urban uses based on existing general plans; conversion of urban to industrial uses; or water development projects that will come online soon. Prepare documentation explaining any changes relative to current conditions, and display the results.

Task 3: Use Salinity of Rio Grande Water to Estimate Water Salinity
Use Rio Grande salinity results from the ISC (or other selected model or analysis) and the irrigation season pattern of deliveries to calculate the weighted average salinity of delivered surface water by subarea. For subareas in which groundwater is a significant component of irrigation or M&I water and for which adequate information is available, these data should be included in the overall salinity loading calculation.

Task 4: Review Benefits Methodology
Estimate the benefits of salinity reduction alternatives using the salinity cost method developed and implemented in the PEIA (or other selected model or analysis). In this task, staff will obtain and review the methodology spreadsheets or other analytical tools and data sets used in the selected model or analysis. The purpose is to understand how the methodology works, as well as how input and output are formatted.

Task 5 Assess Future Conditions with Project
Forecast conditions with the completed project of each sub area. Quantify and justify changes with the project to any acreages, crop market, water use or production changes.

Task 5.1: Estimate cost of construction, operation and Maintenance of Salinity Reduction Analysis
For each study subarea, implement the chosen analytical model for construction, operation and maintenance of alternatives, using avoided costs and avoided damages, allowing for limited changes in cropping patterns or M&I changes. All evaluations described below would be repeated as needed for each salinity reduction alternative, subarea, and point in time.

Task 5.1: Estimate Benefits of Salinity Reduction Alternatives
For each study subarea, implement the chosen analytical model for the benefits derived from the construction, operation and maintenance of alternatives. All evaluations described below would be repeated as needed for each salinity reduction alternative, subarea, and point in time.

Evaluate Potential M&I Changes
Assess whether water salinity appears to be a significant limitation on municipal water system or industrial development. This would be done through a combination of field surveys, aerial measurements, Marshall and Swift Valuation Service estimates, interviews with municipal utility engineers, railroad companies, etc. in subareas to determine existing infrastructure; population; land use; structure types and values; industrial types; and M&I water use rates.

Evaluate Potential Cropping Changes

- First, assess whether irrigation water salinity appears to be a significant limit on crop selection within each subarea. This would be done through a combination of agronomic assessment of irrigation practices, water quality, and crop yields, as well as interviews with local growers, extension experts, and others.

- Second, survey local crop market experts to develop an estimate of the market effect of increased acreage of alfalfa, chile, corn, onions, and other crops that could increase in currently salinity-impaired portions of the study area. Contacts should include university and extension experts, USDA staff, and local commodity market representatives. The purpose would be to assess how the market for these crops is expected to expand over time as a result of population and other demand pattern changes. From this information, determine an upper limit on expansion of the crops. If no reasonable limit can be determined, then consider only changes to acreage of basic crops defined in the U.S. Army Corps of Engineers Planning Guidance Notebook, ER 1105-2-100 (PGN) such as alfalfa and corn.

- Third, for subareas determined to be limited in crop selection, evaluate the effect of the change in irrigation water salinity on basic crops (as defined by the PGN) that could come into production. For those crops that could profitably increase in acreage, allow their proportion of subarea acreage to increase only up to the proportion of the least-salinity-impaired subarea. Estimate the increase in net revenue using method(s) developed in the selected model.

Task 6: Review and Revision of Draft and Final Analysis
The A-E shall present the draft cost/benefit analysis for all subareas to the Corps and Cost Share Partners for their review. All comments from the Corps and Cost Share Partners will be documented and addressed. Necessary revisions will be completed by the A-E and a final analysis will be prepared.

Task 7: Presentation of Final Analysis to the Rio Grande Salinity Coalition
The A-E shall attend a 2-day Coalition Meeting in Las Cruces, NM. The meeting the afternoon of the first day of this meeting will be with Corps and Cost Share Partner staff only, and the following day will be salinity Coalition meeting. The A-E shall provide information to be presented at the Coalition meetings to the Corps' Project Manager and Cost Share Partner staff 5 days prior to the meeting. The Meeting will consist of the A-E presenting findings from the final economic analyses